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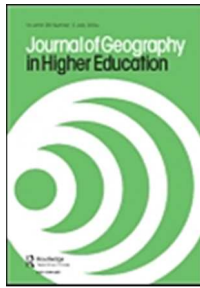
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Mapping pedagogic frailty in geography education: A framed autoethnographic case study.

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Abstract

Pedagogic frailty has been proposed as a unifying concept that may help to integrate institutional efforts to enhance teaching within universities by helping to maintain a simultaneous focus on key areas that are thought to impede development of pedagogy. These areas and the links that have been proposed to connect them are interrogated here through the analysis of an autoethnographic narrative produced by a community ‘insider’ who has considerable experience of teaching and researching geography. This person-centred methodology acknowledges the subjective nature of teaching, gives voice to important stories that might not otherwise be heard formally, and provides a case study that can be used as an exemplar to promote institutional dialogue about quality enhancement and the student experience. The findings from this case study suggest that colleagues may be able to repurpose disciplinary concepts to help make sense of the learning and teaching discourse.

Keywords

Autoethnography, Concept mapping, Exaptation, Pedagogy, Resilience.

Introduction

There is a danger that the energy spent by universities to improve the quality of teaching and learning will be distributed and diluted among a number of separate and disconnected initiatives, for example improving feedback practices, assessment procedures or the application of digital technologies. In order to integrate these efforts and increase their overall effectiveness we require a unifying concept to bring key elements into simultaneous focus. To address this problem, this paper interrogates the emerging concept of, *pedagogic frailty* (Author, 2015). The aetiology of elements contributing to pedagogic frailty are traced here through analysis of a community insider's autoethnographic narrative (Austin & Hickey, 2007; Trahar, 2013).

Pedagogic frailty

From time to time we can identify concepts from other disciplines that can be helpful in making useful analogies in educational research. For example, within the clinical literature "frailty" is considered to develop as a consequence of a decline in a range of factors which, when combined, result in an increased vulnerability to sudden adverse actions triggered by relatively minor events (Clegg and Young, 2011). Various indicators of frailty have been identified including the inability to integrate responses to change in the face of stress (Rockwood, *et al.*, 1994); the loss of adaptive capacity due to a loss of complexity (Lipsitz, 2002); the wear and tear that results over time by repeated efforts to adapt to change (Seeman, *et al.*, 2002) and the sense of fatigue when change is implemented without consultation (MacIntosh *et al.*, 2010). These issues offer considerable resonance with the pressures felt by academics teaching at university. In the context of higher education teaching, one might observe *pedagogic frailty* (Author, 2015; 2016a) when colleagues find the cumulative pressures of academia eventually inhibiting their capacity to change practice in response to an evolving teaching environment, leading them to adopt what they might consider a 'safe' and sustainable pedagogic approach (Canning, 2007; Bailey, 2014).

Conservatism in teaching approaches leads to a convergence on traditional views of teaching in which the transmission of content dominates, and teaching is structured as a procedural chain of practice (Author *et al.*, 2008), that includes "stand-and-deliver lectures by god-Professors that would make Freire weep with despair" (Hay, 2015:1). This may be most pronounced in high-ranking institutions, where value is given to established practice and tradition to the extent that 'universities hang on to past practices to the point of imperilling their futures' (Christensen, 2011: xxii). In their report on the stratification of pedagogy across UK universities, Stevenson, Burke and Whelan (2014: 39) conclude that the overall picture is complex, "with institutions striving to distinguish themselves as distinct while at times, homogenising their approaches to teaching excellence, pedagogic practices and the overall student experience." Within such an environment, it is understandable to see why colleagues may find the idea of the 'scholarship of teaching' feels like an unhelpful distraction from their daily work (e.g. Boshier, 2009). The narrative commentary will reflect local conditions and the personal perspective of the autoethnographer.

Drawing on interviews with academics, and on dialogues with participants on academic development programmes at both of the authors' institutions, a tentative model of the relationships between the dimensions of pedagogic frailty has been proposed by Author (2015) and shown to resonate with the perceptions of colleagues teaching in a variety of academic disciplines (Author *et al.*, 2016) (Figure 1). This model has value as an organising framework to guide discussions among disciplinary peers.

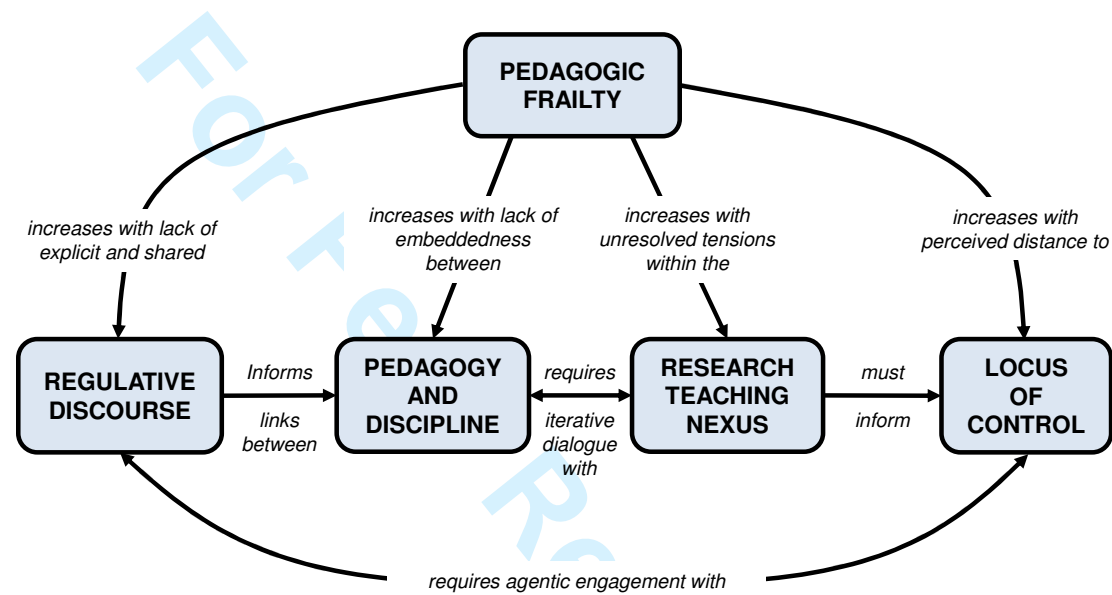


Figure 1: An outline model of the related dimensions of pedagogic frailty (from Author, 2015).

The applicability of this model has not previously been investigated in the context of geography education. The description of the elements of pedagogic frailty will always be coloured by the interviewee's personal professional trajectory and so it was anticipated that a case study in geography education may offer a different perspective to those gained previously from colleagues in engineering, healthcare, performing arts, business and psychology (Author *et al.*, 2016). The methodology to uncover this has to focus on the quality of the data, and in particular on the links between the components as these will determine how the model impacts upon the individual's teaching and developing academic identity. We have, therefore, opted to undertake an autoethnographic study of a single case.

Autoethnography

Acosta *et al.*, (2015) have drawn from analytic (Anderson, 2006) and collaborative (Chang *et al.*, 2013) autoethnography in order to develop a research framework that maximises rigor and trustworthiness of studies. The work presented here fits with this framework. It exhibits the three characteristics of analytical autoethnography listed by Anderson (2006) to maximise methodological transparency. That the autoethnographer is:

1. A full member of the research setting.
2. Appears as a co-author of the published text.
3. Committed to an analytical research agenda.

Additionally, collaborative autoethnography (Chang *et al.*, 2013) supports a dialogic, interactive process in which the researcher discusses and interrogates findings as a form of triangulation. Acosta *et al.*, (2015: 4) therefore define their framework for collaborative and analytic autoethnography (CAAE) as a form of enquiry where,

“practitioner-researchers investigate the contextualised self and Other via personalised narratives, self-reflection, and dialogic discussions; and connect their new knowledge to socio-economic, cultural, and political determinants of individual and group beliefs, values, attitudes and behaviours.”

Autoethnography can be distinguished from ‘autobiography’ or ‘memoir’ as it makes explicit effort to inform the readers’ understanding of some aspect of the social world that exceeds the autoethnographer’s individual experience (Butz and Besio, 2009). This is achieved here through triangulation of perspectives as the autoethnography is interrogated through reference to the guiding model that has been developed in dialogue with others (Author, 2015).

Pedagogic frailty and teacher agency

It may be helpful to note that there is some resonance between the literature on teacher agency and the concept of pedagogic frailty. Teacher agency can be defined as the capacity of actors to “critically shape their responses to problematic situations” (Biesta and Tedder, 2006: 11). As stated by Archer (2003: 6):

“The key theoretical assumption made is that academics ... have ‘agency’. This firstly means that they can anticipate the relative ease or difficulty that they may encounter in the pursuit of improving their teaching. It also means that they have the capacity to circumnavigate constraints strategically to either achieve their desired goals or pursue a ‘second best’ alternative outcome. As such, academics have ‘degrees of freedom in determining their own course of action”

Within the frailty model, it is clear that there are elements that could impede these responses, but that does not necessarily mean that it has an effect of an individual's sense of agency. The importance of the individual's teaching environment on mediating agency has been analysed by Priestly, Biesta and Robinson (2015: 3):

“...we do not see agency as a capacity of individuals, that is, as something individuals can claim to ‘have’ or ‘possess’, but rather see it as something individuals and groups can manage to achieve - or not, of course. Agency is therefore to be understood as resulting from the interplay of individuals’ capacities and environmental conditions. This makes it important not just to look at individuals and what they are able or not able to do but also at the cultures, structures and relationships that shape the particular ‘ecologies’ within which teachers work. It is the interaction between capacities and conditions that counts in making sense of teacher agency. “

In the same way that Priestly *et al.*, 2015 would not label an isolated individual as ‘possessing agency’, we would not wish to label an individual as ‘frail’. It is the connections (or lack of them) between dimensions of the model and/or between members of the community of practice that would confer frailty in the wider system. Therefore, a particular individual or group of academics could exhibit a strong sense of agency within their professional work, exhibiting control over their professional development trajectories and success in their research. However, attributes of frailty may be observed if members this group could not make sensible connections within their own profiles (e.g. between research and teaching, or between pedagogy and their discipline), or with their wider community (others in the department who hold opposing values). It may be that the regulative discourse of the department is not explicit, the links between teaching and research are poorly articulated, or connections with the locus of control are superficial. In such an environment the students may suffer from ‘safe’ pedagogic practices that fail to reflect the values and aspirations of the teaching team (e.g. Bailey, 2014).

The single-case study

The single-case study is a well-established method with precedent in the pedagogical literature (see for example Cribb and Gewirtz 2006; Sembi 2012). Its strength is to offer the intensive study of one individual. The richness of the data produced can be a valuable tool for the ‘bottom up’ generation of research questions and identifying previously unnoticed phenomena of potential importance, which can otherwise be lost within inter-individual variance (see Figure 2) in order to develop theory inductively (Eisenhardt and Graebner, 2007). Kazdin (2010) provides a methodological overview of the ongoing relevance of the single case study.

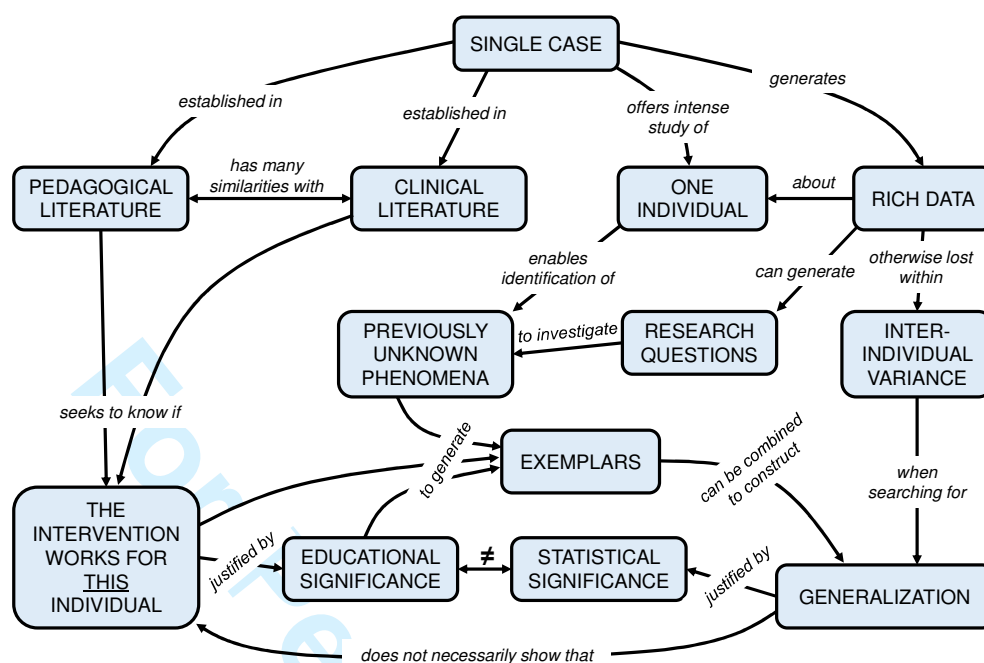


Figure 2: An overview of the single-case study approach (From Kinchin & Wilkinson, 2016).

Flyvbjerg (2006: 219) comments that: "a scientific discipline without a large number of thoroughly executed case studies is a discipline without systematic production of exemplars, and a discipline without exemplars is an ineffective one."

Method

The most challenging part of the autoethnographic process is often the recall of memories from which to review and reconsider influences on lives and identities. Austin and Hickey (2007) describe how a participant in an autoethnographic study often presumes that their life is unexceptional. However, it can be full of formative experiences that are overlooked or forgotten. When exposed to the rigors of the autoethnographic gaze, these memories yield "illuminative moments of insight" (Trahar, 2013: 371). In order to frame the autoethnographic narrative and to frame the autoethnographer's gaze, an introductory concept map-mediated interview was used here to encourage the interviewee to focus on the elements of pedagogic frailty with a separate map constructed for each section of the model in Figure 1. The concept map-mediated interview (as detailed by Kandiko-Howson and Kinchin, 2014) emphasises the links between the ideas discussed. The standard interview set-up requires the interviewer to present questions to the interviewee in order to gain access to the interviewee's individual insights and personal perspective. This is achieved by engaging in dialogue (verbal or textual) that is by its very nature linear in structure. Within that linear narrative, it is then up to the researcher-interviewer to determine the underlying conceptual structure

within that dialogue to construct an interpretation of the interviewee's understanding. For each of the five maps the interviewee was presented with some prompt concept labels (as described by Author et al, 2016) and asked to describe how they may be linked to construct a personal perspective of the discourse of the discipline. Further questioning was simply to seek clarification and deeper explanation of the concepts chosen and the links made. Here the interviewer was an experienced academic developer who was from a different institution to the interviewee.

In comparison with the standard interview, the dynamics within the concept map-mediated interview are altered in a subtle, but significant way. The interviewee exposes his/her knowledge structure during the interview through the construction of the concept map that emerges from the dialogue between the interviewer and interviewee. Previous studies have shown concept mapping (Novak, 2010) to be the ideal tool to make learning visible and to externalise the relationship between public and personal perspectives on learning in higher education (Hay et al, 2008; Kandiko et al, 2013). The interviewer's role is then to prompt the interviewee with questions to encourage him/her to interrogate his/her own knowledge structure as it emerges on the page. The interviewer no longer has to impose a structure on the linear narrative, but rather interpret the structure that has emerged from the dialogue (Kinchin, Streatfield and Hay, 2010). This process reduces the possibility of the interviewer imposing an inappropriate knowledge structure based on his/her prior conceptions, whilst the dialogue between the interviewer and interviewee ensures that the structural grammar of the resulting maps is consistent.

The resulting concept maps that are created during the interview dialogue are the main artefacts for analysis. As described by Wilson et al., (2015):

"Concept mapping is a medium through which people come to understand more about an event and about themselves. This change of self, re-shapes the meaning of the phenomenon that is being studied, and offers the participants an opportunity to "re-see" the significance the experience and the mapping process offer them (Through this process of "re-seeing," participants develop an artistic expression of self-discovery (the concept map) and their voice resonates on both an individual and a social level."

Whilst no restrictions were placed on the interviewee regarding the number of concepts to be included, the process used 38 x 50mm self-stick notelets to act as the nodes on which the concept labels were written, and these were stuck to a sheet of A3 paper. Once the sheet was becoming full the interviewee tended to stop adding new ideas, providing a helpful mechanism to regulate the size of the resulting maps. This in turn helps the interviewee to concentrate on the key ideas they want to present in the available space. The ability to be concise within a concept map is regarded as one of the criteria for excellence (Cañas, Novak and Reiska, 2015). The interviewer is also able to prompt the interviewee to ensure that linking arrows are adequately labelled to provide meaning and to maximise the explanatory power of the map. Once the interviewee is happy that the resulting map offers a fair representation of their perspective, it is digitised by the interviewer and returned to the interviewee who is then invited to make any amendments they want to. Archer (2008: 400) has

commented on how “writing about academia is inherently challenging, particularly for those ‘on the inside’”, and for some interviewees, the construction of certain parts of a concept map that focusses on their professional experience can prove to be an emotional experience as they recall key moments of their career. The set of completed concept maps (one for each of the five dimensions in Figure 1) is then returned to the interviewee/autoethnographer to act as prompts for the writing of their autoethnographic narrative. This narrative is then interrogated by the researcher/interviewer in order to tease out themes, in dialogue with the interviewee and contextualised within the relevant research literature.

Ethical considerations

Whilst no other parties were directly involved in the research outlined in this paper, we acknowledge that autoethnography still has the potential to raise ethical concerns (e.g. Tolich, 2010). Chang (2008: 68) has commented that protecting the privacy of others, who may appear as ‘associates’ or ‘background characters’ within an autoethnography may be more difficult than in clinical studies that involve human subjects. This is because the identity of the autoethnographer cannot be bracketed out from the research (Holt, 2003). We have, therefore, made every effort to avoid comments that could lead to the identification of ‘others’ within the narrative.

The personal narrative

What follows in italics is the geographer’s autoethnographic narrative, framed by concept maps that were developed within an in-depth, map-mediated interview:

Biographical context

“I have lectured in ecology and biogeography – among other things – on Geography programmes for around twelve years, since completing my PhD in 2004. My undergraduate education was in Landscape Ecology (the most geographical of the ecological sciences) and my PhD was focused on river ecology (Author2, 2004) but housed within a School of Geography, Earth and Environmental Sciences. Geography and geographical education and research has been my disciplinary home throughout my academic career, though I never formally studied what might commonly be held as ‘Geography’ at higher education level. My research is broadly biogeographical, though focused most specifically on urban and freshwater ecosystems, which tend to be the province of ecologists rather than geographers (e.g. Author2, 2011; Author2, 2012; Author2, 2012). I have always been somewhat interdisciplinary, initially combining research into ecology and geomorphology (e.g. Author2 et al. 2008; Author2 et al. 2009) and more recently integrating elements of human geography or the social sciences into my work, most specifically with regards to biodiversity conservation (Author2 2010), urban

ecologies (Author2 et al. 2012) and the environmental considerations of warfare (Author2, 2014).

Geography has been a difficult discipline to embrace in some respects. Some countries (e.g. the UK) have a strong tradition of teaching geography, while others do not. The 'harder' sciences can look down on geography as a very soft science, and being a 'geographer' (rather than ecologist or biologist) can be a hindrance in the ecological community. The interdisciplinarity of the subject can be perceived as a strength or weakness, depending on the background and perspective of the observer. My own familiarity with the Geography curriculum and its disciplinary nuances and idiosyncrasies developed over several years, but particularly when I undertook senior roles within various teaching committees that were responsible for curriculum design and execution. These roles have been invaluable in providing context for my teaching experiences."

Regulative vs. instructional discourse

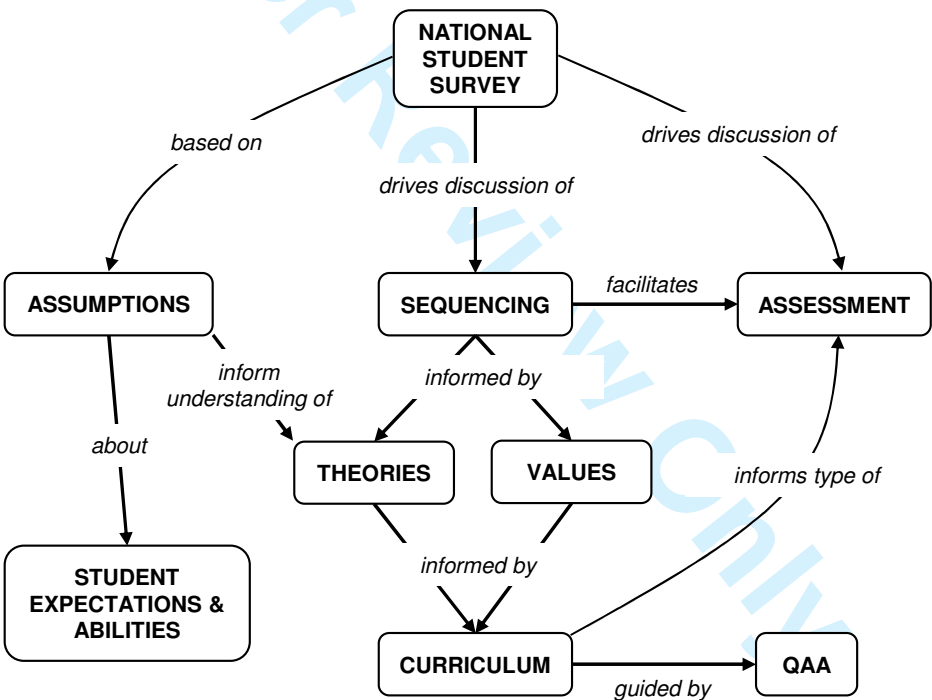


Figure 3: Concept map of regulative vs. instructional discourse.

There is endless debate about what is best for the students in terms of teaching instruction vs. experience, and the desire to satisfy them over challenging them and therefore risking dissatisfaction. This is particularly topical in the UK because of the National Student Survey (NSS), which is used as a metric to rank departments and institutions, and therefore their educational 'success'. Increasingly concerns of the NSS

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3 frame decisions made that influence curriculum content and logistics of delivery, whether
4 appropriate or not – it is therefore a semi-formal form of regulation (Figure 3). Within
5 Geography, the heterogeneity of student background and interests raises complications
6 and it is difficult to make valid assumptions about what students expect, want and are
7 capable of. For years in my first-year tutorials, I have asked students how they have
8 found the modules that both human and physical geography students take in common. I
9 have often been told that they “didn’t come to university to learn [whatever topic they
10 don’t like]”. Until they are educated that many societal or environmental problems can’t be
11 understood, let alone solved, without some understanding of both environment and
12 society, and how they interact, this situation persists. Some students eventually
13 understand and embrace this, and some don’t. This is not a problem in itself, but it does
14 make underlying assumptions that we are all on the same road and driving in the same
15 direction, somewhat problematic.

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22 Concerns over student satisfaction can perhaps drive positive changes for the wrong
23 reasons. Fieldwork, for example, has always been a central part of the Geography
24 curriculum – the world cannot be understood entirely from the literature, but must be
25 experienced first-hand. Fieldwork, especially with large student numbers, can be time-
26 consuming and logistically challenging. Despite the pedagogical value of fieldwork, this
27 therefore tends to be a limited component of undergraduate teaching. However, because
28 of the perceived ‘fun’ and ‘exoticism’ of field activities, many of which take place
29 overseas, there seems to be an increase in field activities within the discipline more
30 recently, as they may potentially increase student satisfaction.

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36 This does challenge resilience of delivery however. Fieldtrips tend rely on a small
37 number of key staff who are familiar with the field location and the activities to be
38 performed. Staff absence (through changing institution or due to sabbatical or illness) can
39 threaten the field activities. This is not always a problem, but is something that can
40 weaken the function of the department if not accommodated correctly – especially if there
41 are many field components in the syllabus. It also means that staff away on fieldtrips
42 cannot perform other teaching or pastoral roles in the department, and can create further
43 instability.

Relating pedagogy with discipline

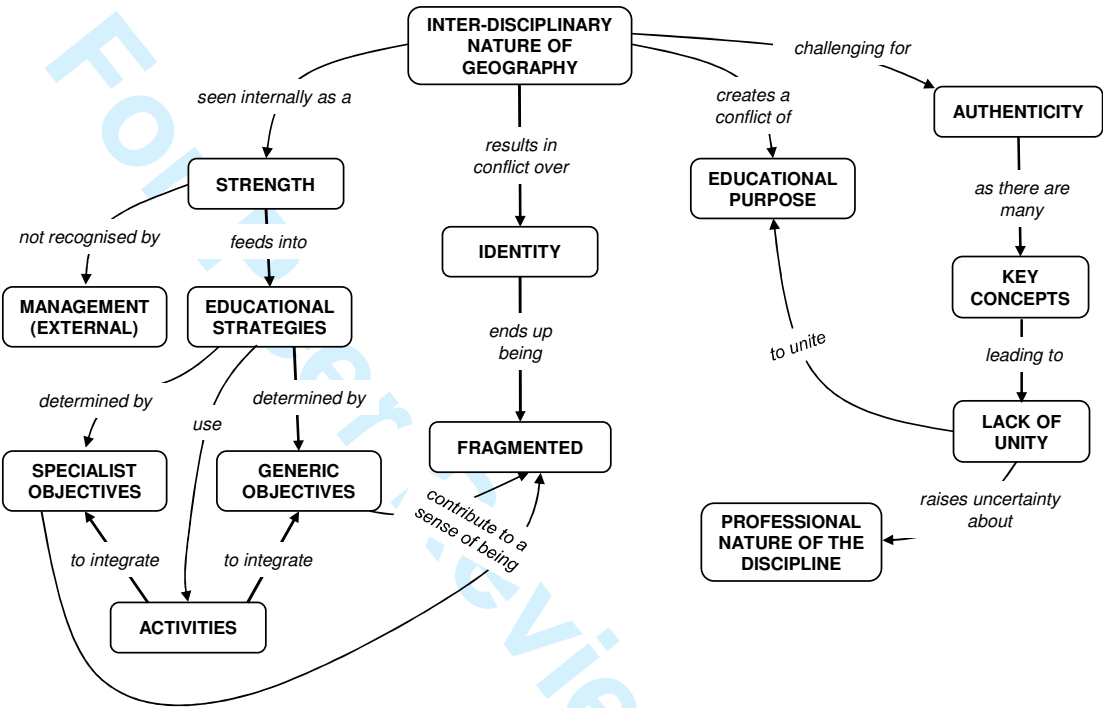


Figure 4: Concept map relating pedagogy and discipline.

Geography is inter-disciplinary by its nature (Figure 4), and teaching staff come from a wide variety of disciplinary and research backgrounds that may not always involve a comprehensive understanding of its key concepts. Combined with a desire and expectation of staff to teach to research specialisms and experience, this creates two tiers of teaching responsibilities: those modules teachers desire to teach, aimed perhaps at smaller groups of advanced students with some relevant preliminary knowledge; and those modules that are designed to impart important key concepts and skills relevant to the discipline, but which tend to have larger numbers of students (with different backgrounds, abilities and interests) and more generic content. The latter has often been termed ‘service teaching’ in my experience. This is made more complicated by BSc and BA Geography students often having different backgrounds and interests, yet holding modules in common. Students may come from backgrounds in the sciences or humanities. Satisfying and providing appropriate content and challenges for such a heterogeneous audience is therefore difficult, and a situation that is less likely to occur in many other undergraduate curricula.

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A tension therefore exists between teaching more advanced and specialist modules, and providing more basic but important geographical knowledge that allows students to appropriately access and appreciate that advanced knowledge. If the balance is not achieved, it can make the discipline appear to be little more than a collection of peripheral topics rather than a coherent subject, threatening its identity.

When I was initially hired as a junior lecturer, I was informed which teaching I would need to cover within the existing curriculum, and that I could also teach a final-year module of my choosing. The 'service teaching' module that new staff tended to be allocated was a first year module focusing on methods of data collection and analysis. The module was consistently unpopular with students, largely a legacy of a succession of staff teaching material that they themselves found unsatisfying to students who often didn't recognise the value of the module content and its relevance to Geography. Much teaching committee discussion took place in relation to what an appropriate syllabus would be and what level of difficulty was required. In particular, it was argued that BA (human geography) students did not need detailed statistical training, as they were unlikely to use such techniques and were far less 'quantitative' than their BSc (physical geography) counterparts. There was a perceived tension between the satisfaction of the students (who were challenged or uninterested by the module content), and the value of statistical training that might facilitate research ability and future employment. This was largely overcome in due course by reinforcing the inter-disciplinary links and demonstrating to students that such skills are held in common.

Research-teaching nexus

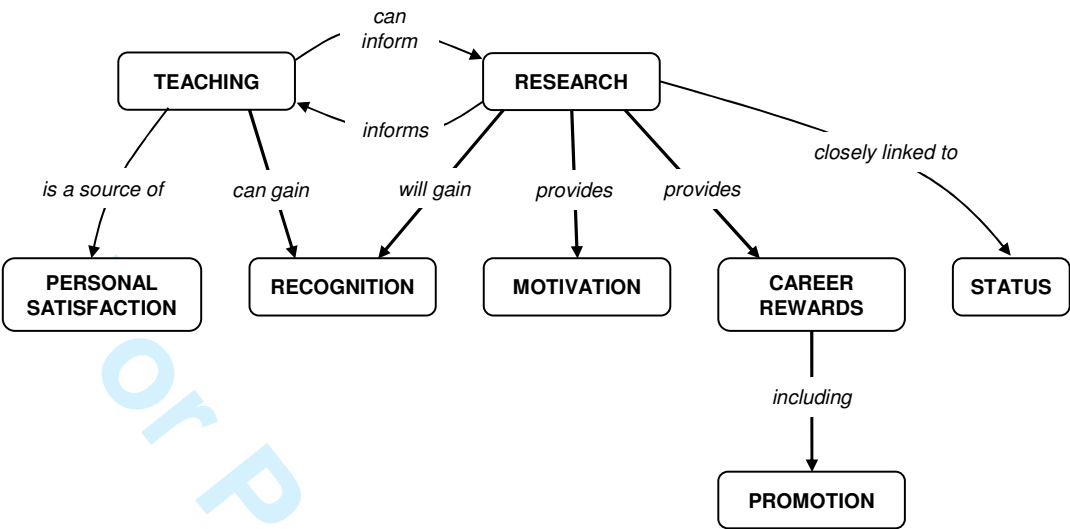


Figure 5: Concept map of the research-teaching nexus.

Teaching is internal-facing, while research is outwards-facing. While teaching is an important and potentially rewarding aspect of the academic role (Figure 5), it is mainly regarded as ‘something that needs to be done’ while the real point of the job (and the reason most lecturers became academics) is to get the research done. Research is unavoidably linked to career development, because most promotion assessment is based on validation by international referees. The teaching and administration/service completed by lecturers can be quantified at some level internally, but means little when viewed from outside of the institution without clear evidence - such as teaching awards. Research output is much easier to judge and quantify, and facilitates career development across universities at national and international levels. Being a valid future submission in the Research Excellence Framework (in the UK) and having a good research profile is far more important to most interview panels than evidence of teaching skill or investment. Much career motivation therefore links to research rather than teaching.

Teaching can however provide much personal satisfaction. Several years ago I was at a high-level meeting about developing methods to strengthen links between research and teaching. A very prestigious professor from another department, widely known for his research, made the point that the career of the typical academic resulted in incremental progress in their field of research, unless they had extraordinary ability and great fortune. In contrast, over a forty-year career, thousands of students are likely to be instructed by a typical lecturer, and so the educational contribution to both individuals and society is substantial. Teaching contribution can far outweigh that from research in many cases. Since then I have felt greater personal satisfaction in my teaching, seeing it as part of a

continuum of valuable service that may not be appropriately recognised institutionally or internationally but is as important a legacy as research output.

Locus of control

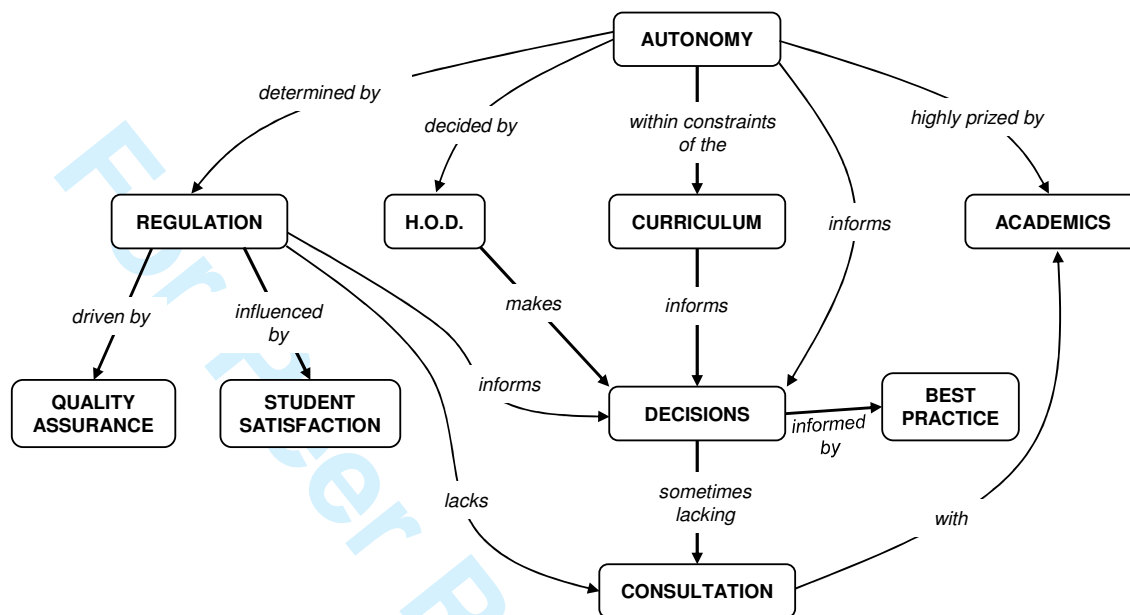


Figure 6: Concept map of locus of control (HOD = Head of Department).

"Academics greatly value the autonomy inherent to the profession – they are free to research and teach whatever they want, within the limits of the curriculum and what is required by their department (Figure 6). Regulation at various levels influences this autonomy, ranging from university policies on how teaching is performed and staff and student performance assessed (e.g. term dates, exam duration, marking criteria, electronic marking, feedback times, pastoral care etc.) to departmental expectations on teaching delivery, tutorial engagement, project supervision and workload balance. The latter are more negotiable and it is easier to incorporate best practice at this level, for example shared amongst colleagues. The higher the level of regulation, the more difficult it is to incorporate best practice or find a single model that suits all departments or forms of teaching engagement. This can have both positive and negative influences on teaching performance.

Technology-enhanced learning is a good example of this. Many UK universities are utilising electronic platforms to help with teaching and assessment, including online marking; there are many reasons for this, an important one being to increase the amount and quality of feedback to students. This was a positive development in my experience. Although there were initial concerns about the amount of time that would need to be

spent sitting at a computer and reading from the screen, and whether assessments would take longer to mark, the decision to make this a requirement (rather than an option) across the university meant that staff had to engage with it, and helped to overcome the inertia associated with change. Although this form of regulation did increase the amount of time spent marking individual assessments (roughly double), I found that I wrote much more feedback than I would by hand, and the freedom to be able to mark from a computer anywhere in the world – rather than having to collect and carry around dozens of scripts – was quite liberating. The autonomy of place – being able to work where and when convenient, and thereby balance different work and personal demands on time, was actually enhanced by this form of regulation. I doubt that all of my colleagues see it that way, but it worked for me. Such efforts may not have resulted in the increases in student satisfaction that were perhaps hoped for, but in my view have certainly improved the quality of education provided and flexibility of staff working patterns. “

Pedagogic frailty

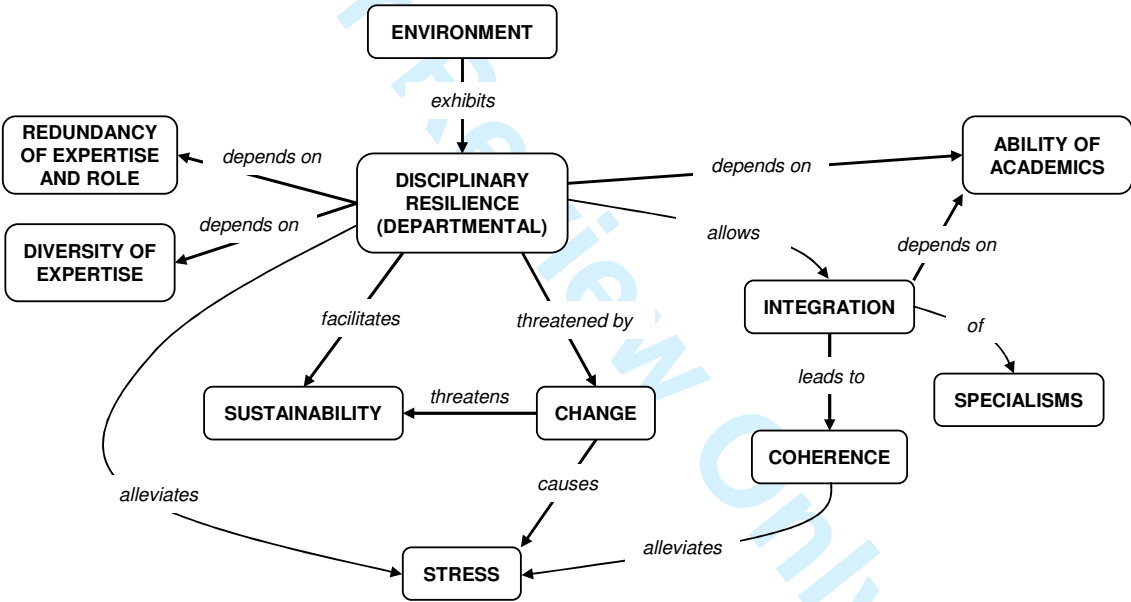


Figure 7: Concept map of the overarching elements of pedagogic frailty.

Resilience of the department depends on redundancy of expertise and role in particular (Figure 7). My disciplinary background in ecology gives me a predilection to examine a university department through the lens of system resilience, seeing the department as the functional unit rather than individual academics. Staff tend to be appointed based on research ability and ‘fit’ within the department, complementing other research interests, rather than on ability to cover key aspects of the Geography curriculum (which is after all

quite flexible and heterogeneous). This does tend to result in a community of specialists rather than generalists, and as an ecologist might observe, a community composed of specialists is usually far less resilient in the face of disturbance than one of generalists. Academic generalists tend to be undervalued – I would consider myself a generalist and have been told several times during my career that having a wide range of teaching and research interests is a sign of a lack of focus (the ‘jack of all trades’ model), rather than representing an important functional role within the department. For example, when the one person in a department that can teach geo-hazards goes on sabbatical, the choice to cancel those modules or find a temporary replacement can create complications, especially when students are expecting certain modules to run and have been looking forward to taking them. Sometimes individual academics are responsible for running key modules or directing entire programmes and their sudden absence and the need to find alternatives creates stress across all levels of organisation, from students to the Head of Department. Greater redundancy of role within the department (e.g. through more generalisation) allows much better integration of material and ensures quality of delivery. The teaching of statistics or surveying methods for example is facilitated by the presence of half a dozen staff with the appropriate knowledge, so that even if someone is absent, the essentials can still be taught. This is less possible the more specialised the teaching is, but a more specialised topic is also probably less ‘essential’ to the curriculum.

I teach on a large first year ‘environmental change’ module that all Geography students must take, and have done for over a decade. The topic I teach (the Biosphere and the Biodiversity Crisis) cannot be easily replaced with another topic in my absence, but this would not be required as there are several staff who could cover the same topic. It is therefore an important and resilient part of the syllabus, and in this context my (and others) teaching role has some useful redundancy built into it. If that were not the case, my absence (e.g. during sabbatical periods) would be a distinct problem. In contrast, one of my final-year modules was discontinued several years ago due to a surfeit of similar options at that level, and there was no need for any replacement. It was a popular module and a pleasure to teach but was not an essential component within the programme.”

Discussion

The narrative starts with a focus on pedagogic discussions about teaching of materials through instruction or acquired experience that would be a feature of the regulative discourse (Bernstein, 2000). This is then tempered by the autoethnographer’s focus on the pressures created by the National Student Survey (Figure 3) and the ways in which this may, “drive positive changes for the wrong reasons”. This includes the perceived resurgence of fieldwork activities in the curriculum, not because they help to build a community of learners (e.g. Walsh *et al.*, 2014) or to foster links between

teaching and research (e.g. Fuller *et al.*, 2014), but because they may increase student satisfaction ratings.

The concept map of regulative vs. instructional discourse (Figure 3) suggests the autoethnographer's overall perspective in which 'sequencing' and 'assessment' are high on the agenda (instructional discourse) has a foundation in 'theories' and 'values' that are also used to guide 'curriculum'. A values-led perspective is not always evident in such graphic depictions (see Author, 2011).

Disciplinary Fragmentation

The interdisciplinary nature of geography, and the consequent fragmentation of the subject appears central to the autoethnographer's view of the discipline (Figure 4). The narrative describes the teaching of both human and physical geographers, who have been shown to exhibit explicit differences in their perspectives and actions (e.g. Johnston, 1998; 2003).

The fragmentation of disciplines may be a natural part of their evolution and maturation which brings both benefits and problems along the way. Barrett (2001) has described the evolutionary cycle that can be traced through the history of ecological/environmental sciences (figure 8). A similar cycle of events might be viewed within the development of teaching as a field of scholarship (e.g. Rowland, 2002), with pedagogic frailty potentially providing a mechanism to support re-integration.

[Figure 8 deleted]

Figure 8: A historical perspective (1850—2000) depicting the evolution of ecology and the ecological/environmental sciences. Starting with the diagram section (ecosystem) in the upper left corner, the fragmentation of biology and ecology is shown clockwise fashion hopefully leading to a more unified and integrated science. (From Barrett, 2001 with permission © Blackwell Science, Inc.).

Research-Teaching Nexus

The research-teaching nexus has been explored extensively within higher education (e.g. Healey, 2005), and is often considered to be one of the factors that separates higher education from compulsory education. The view provided of the research-teaching nexus in this case study is typical of those expected from academics who would place themselves in a domain such as physical geography, alongside the other sciences (Figure 5) in which the tension between teaching and research is evident (Author, *et al.*, 2016). This tension results from perceptions of the asymmetric rewards system that favours research over teaching. Here the autoethnographer comments on extrinsic rewards (including promotion) associated with research, and intrinsic rewards for teaching.

However, it is also clear that within a single geography department a range of views may be held by academics in terms of how their research relates to their teaching activities (e.g. Abrahamsson, 2013).

Resilience

Within the autoethnographer's map of pedagogic frailty (Figure 7), the concept of resilience is central and highly connected to other key concepts such as sustainability, change, integration, ability, diversity and redundancy of expertise. The interactions between resilience and other concepts therefore appears very important to this colleague's overall conception of frailty. As stated by Mansfield *et al.* (2012: 361), it is not helpful to simply list attributes of teacher resilience and expect academics to be able to construct an appreciation of their situation from a selection of disconnected elements, as "on their own, they do not account for resilience as a dynamic process of interactions." Pedagogic frailty here provides a higher order framework that offers the "capacity to show the overarching and overlapping dimensions of teacher resilience". We can see in Figure 7 that the interactions are explicit in the mind of the academic.

Drawing from the autoethnographer's home discipline of ecology, we can draw some analogies with the concept of resilience within higher education. In their consideration of the importance of ecological resilience, Mumby *et al.*, (2014: 22) state:

"Ecosystem management is fundamentally charged with maintaining desirable levels of ecosystem function in a cost effective and socially responsible manner. The ability of an ecosystem to function depends on its state and the processes that support it."

We can see that this resonates with the need to manage the teaching environment in a cost-effective and socially responsible manner by monitoring support processes. Perhaps it is inevitable that an autoethnographic narrative on pedagogic frailty will draw upon the author's disciplinary knowledge in order to make sense of structure of his/her profile. Here, the autoethnographer makes references to resilience and functional redundancy that stem from his appreciation of these concepts within ecology (e.g. Rosenfeld, 2002).

Some authors have attempted to link ecological and social interpretations of these concepts (e.g. Adger, 2000), whilst, more commonly, educational research has used ecological analogies to make sense of social phenomena (e.g. Author, 2000; Keiny, 2002; Biesta and Tedder, 2006; Stelma, 2011; Priestley *et al.*, 2015).

Ecosystem resilience is essentially a means of conceptualising the amount of disturbance an ecosystem can take before its current 'stable state' or 'domain' is sufficiently altered that key parameters of ecological structure and function change, and a new stable state is created (see Holling, 1973). It therefore represents the persistence of key components and relationships that maintain the system in a particular state, and recognises system dynamism; that some system components or processes may change without the stable state being altered, but that with sufficient

disturbance, system collapse and reorganisation is inevitable (e.g. Holling, 2001). The ecosystem resilience concept has migrated across sociological and economic disciplines and transformed along the way, such that Brand and Jax (2007) have been able to categorise ten relatively distinct interpretations of resilience that have emerged in various system contexts.

Teacher resilience refers to those teachers who withstand the ebbs and flows of the educational sector and who keep on teaching despite all the negative factors (Ebersöhn, 2014). Social support networks that provide a sense of belonging and connectedness are deemed as significant coping factors for teachers (Howard and Johnson, 2004; Johnson *et al.*, 2014). Such relationships are seen to "link resources through transactional-ecological processes" that act as a buffer between the individual and the environmental risk factors (Ebersöhn, 2012: 32). Whilst we know that novice university teachers do form professional social networks with colleagues from within their own communities of practice (e.g. Merrill and Hripcsak, 2008) and also with colleagues from the wider university community (e.g. Rienties and Kinchin, 2014), we do not know how this contributes to the development of an individual's pedagogic frailty profile. Where these support networks are not effective, Ebersöhn predicts some negative outcomes that will include the feeling of helplessness which manifests as passivity leading to stress (Author *et al.*, 2016) that can be compounded over time - possibly resulting in burnout, depression, aggression and withdrawal (Ebersöhn, 2012).

Functional redundancy is based on the observation that some species perform similar roles in communities and ecosystems and may therefore be substitutable with little impact on ecosystem processes (Rosenfeld, 2002). The autoethnographer uses the concept of functional redundancy here to describe 'slack in the system', where the loss of a colleague from a department can be covered by other colleagues with similar skills sets or knowledge bases. However, where redundancy (or slack) has been removed through economies or efficiency savings, the system is more frail or vulnerable to both internal and external disturbances, and the autoethnographer makes sense of (or 'imagines') his educational environment and his place within it in these terms.

Exaptation

The autoethnographer's reflections on his teaching of environmental change and biological evolution suggest a degree of pre-adaptation [or to use a more widely accepted term, exaptation] towards pedagogic change - in the autoethnographer's words, "my disciplinary background in ecology gives me a predilection". The term exaptation was originally coined by Gould and Vrba (1982). It is used to describe instances in evolutionary biology where useful attributes 'did not arise as an adaptation for their present role, but were subsequently co-opted for their current function' (Gould, 1991: 43). The classic example from biology is often considered to be the evolution of feathers in birds. Their original function is assumed to be for thermal insulation, with flight only evolving later, after the characteristic had been acquired. In such exaptive instances, function follows form, rather

than form following function as it normally observed in adaptive evolution. The concept of exaptation has been successfully translated into social systems (e.g. Larson *et al.*, 2013; Bonifati, 2015) and in particular to the ways in which technologies have been co-opted for uses that were not originally intended (Garud, 2016).

Garud *et al.* (2016) consider the human capability of *inducing exaptation* as a distinction from biological evolution, as humans have the power to attribute new functionalities to elements under their control. Framed autoethnography *within geography* may offer a mechanism to, “*sensitize us to exaptive possibilities, which in turn enhance the possibilities of capitalizing on their occurrences*” (Garud *et al.*, 2016: 19). The dialogic concept mapping approach to visualising the elements of pedagogic frailty highlights the connections between facets of the academic role and increases the likelihood of occurrence of exaptive events. Hence, in this case, the autoethnographer is able to re-purpose his knowledge of ecological systems and apply them to social systems so that concepts such as resilience and redundancy take on a new function in the field of pedagogy. Indeed, the concept of frailty has been exapted (*sensu* Larson *et al.*, 2013) here from its original context of clinical frailty and co-opted for use in a different discipline to illuminate university pedagogy. *The interviewee's use of 'ecosystem resilience' here to describe teaching may be seen as an example of exaptation.*

Conclusions

By selecting concepts that facilitate analogy with his home discipline (e.g. resilience), the autoethnographer has *exploited* the pedagogic frailty model *as a frame for his narrative* and this has allowed him to engage in a level of reflection that would be difficult if it required acquisition of alien (i.e. educational) *terminology*. The concept map-mediated interview provides the prompt and helps in the deconstruction that then supports reflection to help colleagues to articulate their understanding. The ability to articulate skills in teaching are important for senior teaching colleagues who may be charged with mentoring and supporting junior colleagues through their early years of teaching:

“teachers can express a generalised, generic concept of resilience in their own words but it takes prompting, reflection, and deconstruction before they can identify the explicit skills that they themselves possess. Nevertheless, they display tacit knowledge as they talk about their resilience where tacit knowledge is taken to mean an ability to perform skills without being able to explicitly articulate them.”

(Vance *et al.*, 2015: 5)

Trahar (2013: 371) describes the autoethnographic process as, “illuminating or crystallising” her own pedagogical perspective and so enabling the development of, “a more sensitive insight into those aspects of others’ lives”.

Initial studies into pedagogic frailty suggest that the process of visualisation provides the academic with a problem when trying to depict inter-dimensional links (Kinchin *et al.*, 2016), but that visualising the structure within each of the dimensions of the model is a crucial first step for academics

to engage with the development of their own professional profile. In the narrative explored in this case study there are examples of overlap between the dimensions, allowing the autoethnographer to depict an integrated concept map of the overarching concept (Figure 7). In this he has identified a unifying concept that has been exapted from his home discipline (resilience), while also identifying the need for integration and coherence to support a sustainable approach to teaching within a changing environment.

Using framed autoethnography (i.e. autoethnography whose narrative is framed by concept mapping activities) to explore the elements of pedagogic frailty offers an individualised method for the professional development of academics, particularly senior teaching staff who do not necessarily wish to attend generic workshops or programmes on teaching and learning (Author, 2016b). It allows colleagues to construct a personal narrative against which to make sense of key elements of the pedagogic research literature and the evolving university teaching environment. In this way, professional development may be seen as an individualised, learner-centred (here the ‘learners’ being the ‘teachers’) activity to support personal growth in directions that are pertinent to the individual rather than as a collective activity through generic courses that do not always hit the mark (e.g. Cameron, 2003). The learner-centred, disciplinary focus of this type of professional development ensures a tight fit with disciplinary terminology and confers ownership of the process on the individual academic. This increases the likelihood of the outcomes being cascaded to other members of the individual’s community of practice, contributing to a more critical conversation about teaching in higher education (Rowland, 2001).

The re-purposing (or exapting) of disciplinary knowledge to forge active links with the pedagogic frailty model may offer a general route into the professional development of university teachers. The framed autoethnographic approach is likely to draw upon the autoethnographer’s personal knowledge of their discipline and may highlight disciplinary concepts that may be exapted to enhance and frame professional development. The profusion of ‘ecological models’ in educational research (mentioned above) demonstrates that exaptation is occurring widely at the disciplinary level. This approach could help provide the benefits of exaptation for professional development at the level of the individual university teacher.

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